6—1 Proportions

Ratio—compares two quantities

$a:b$

$\frac{a}{b}$

Example
1860 students
310 athletes

Athlete: student ratio

$\frac{310}{1860} = \frac{1}{6}$

Athlete: non-athlete ratio

$310 : 1550$ $1:5$

Must convert to the same unit!

K H D Base D C M (meter)

2m (200cm)

40cm

L : w

$\frac{200}{40} = \frac{5}{1}$

Simplify

2 ft : 20 in

$24:20$

$6:5$

12 ft : 5 yd (3ft = 1yd)

$12:15$

$4:5$

The ratio of 2 supplementary angles is 4:5. What are the measures of the angles?

$4x + 5x = 180$

$9x = 180$

$x = 20$

$4 \times 20 = 80°$

$5 \times 20 = 100°$

The ratio of the angles in a triangle are 2:3:4. What are the measures of the angles?

$2x + 3x + 4x = 180$

$x = 20$

$40° \quad 60° \quad 80°$

The ratio of the sides of a triangle are 5:12:13. The perimeter is 90 cm. What are the lengths of the sides?

$5x + 12x + 13x = 90$

$30x$

$x = 3$

$15cm$

$36cm$

$39cm$

Do:

1. The ratio of the angles in a triangle are 1:5:6. Find the angles.

2. The ratio of the angles in a triangle are 3:5:7. Find the angles.

Proportion—equation stating 2 ratios =

$\frac{a}{b} = \frac{c}{d}$

Cross Mult $ad = bc$

means

"a is to b as c is to d"

extremes

Product of Means = Product of the extremes

Examples

$\frac{6}{18.2} \times \frac{9}{y}$ $6y = 9 \cdot 18.2$

$\frac{6}{9} = \frac{18.2}{y}$

$27.3 = y$

$\frac{4x-5}{3} = \frac{-26}{6}$ -13

$6(4x-5) = 3 \cdot (-26)$

$24x - 30 = -78$

$+30$

$24x = -48$

$x = -2$

HW
p285-286
#s 12-25 all, 29-35 odd